

Claims

[c0001] 1.A pallet for handling electric motor armatures on automatic production lines, said armatures having an axis and comprising a plurality of portions having axial symmetry, in particular a shaft and an armature stack of ferromagnetic sheets driven on said shaft, comprising a base on which suitable support means are mounted for engaging with at least one of said portions having axial symmetry and for keeping an armature with said axis substantially horizontal preventing it from moving during its transportation

[c0002] 2.The pallet recited in Claim 1, wherein said support means comprise

- means for bearing the armature by said armature stack of sheets, an
- means for holding said armature stack preventing said armature from moving with respect to said support means.

[c0003] 3.The pallet recited in Claim 2, wherein said means for bearing comprise a cradle formed by two rods that are arranged parallel to the shaft of said armature on which two generatrix lines of the armature stack rest

[c0004] 4.The pallet recited in Claim 2, wherein said means for bearing comprise two jaws movable with respect to each other between a first and a second position, in said first position said jaws approaching radially said armature stack for engaging with it, in said second position said jaws moving away for having said armature loaded/unloaded

[c0005] 5.The pallet recited in Claim 4, wherein said movable jaws are mounted sliding transversally to the shaft of said armature and biased by resilient means

[c0006] 6.The pallet recited in Claim 2, wherein said means for bearing comprise two jaws, said jaws running from a first closed position on said armature stack to a second open position forced by a releasing means which can move in a direction substantially orthogonal to said base

[c0007] 7.The pallet recited in Claim 6, wherein said releasing means has surfaces conjugated to surfaces integral to said jaws, in said second position said jaws being influenced by a resilient returning force that biases their moving away from each other, whereby when said releasing means withdraws to a starting nominal position or, in the presence of the armature stack, in said first position where they are closed on the armature stack,

they have a residual resilient force sufficient to hold the armature

[c0008] 8.The pallet recited in Claim 7, wherein said releasing means are integral to a gripper belonging to a means for picking up said armature from the above or from below

[c0009] 9.The pallet recited in Claim 3, wherein said or each jaw has an end shaped in order to form substantially a bevel that makes easier the introduction from the above of said armature stack and the other end hinged to said base, whereby said jaws can move rotationally with respect to each other rotating between said first and said second position biased by a resilient force and resting against said armature stack of sheets.

[c0010] 10.The pallet recited in Claim 2, wherein said support means is arranged as a cradle for said armature stack and has at least one portion of its surface that faces said armature stack of sheets, said means for holding comprising at least one magnet that houses in said portion, whereby the armature stack at said magnet is magnetically attracted thus blocking the whole armature

[c0011] 11.The pallet recited in Claim 2, wherein said support means is arranged as a cradle for said armature stack of sheets, said means for holding comprising an element

suitable for pushing said armature against said support means

[c0012] 12.The pallet recited in Claim 2, wherein said base is provided with an opening to allow lifting means to pass and raise said armature through said pallet from below

[c0013] 13.The pallet recited in Claim 2, a plurality of support means is provided for carrying a plurality of armatures in parallel

[c0014] 14.The pallet recited in Claim 2, having a first and a second axis, where a first support means is provided suitable for carrying at least one armature of a first family size parallel to said first axis, and second support means is provided suitable for carrying at least one armature of a second family size parallel to said second axis

[c0015] 15.The pallet recited in Claim 2, where the support means allow with respect to the pallet to receive an armature both with commutator oriented in a first direction and with commutator oriented in a second direction, opposite to the first, said support means being sized so that when the commutator is arranged in the first direction with respect to the pallet the armature belongs to a first dimensional class, whereas when the commutator is arranged in the second direction, the armature belongs

to a second dimensional class, different from the first, said support means having means for bearing the armature at the armature stack and means for holding the armature stack that are doubled

[c0016] 16.The pallet recited in Claim 1, wherein said means for bearing comprise at least one first and a second support means capable of approaching and/or moving away from each other with respect to the axis of said armature at the moment of receiving and/or releasing a portion of said shaft

[c0017] 17.The pallet recited in Claim 16, wherein said first and said second support means are capable of approaching and/or moving away from each other in a substantially axial direction with respect to the armature axis

[c0018] 18.The pallet recited in Claim 16, wherein said first and said second support means are capable of approaching and/or moving away from each other in a substantially radial direction with respect to the armature axis

[c0019] 19.The pallet recited in Claim 16, wherein only said first or only said second support means move at the moment of receiving and/or releasing the armature axis whereas said second or said first support means respectively remains still

[c0020] 20.The pallet recited in Claim 16, wherein actuating means are provided suitable for causing the mutual approaching and/or moving away from each other of said first and said second support means.

[c0021] 21.The pallet recited in Claim 20, wherein said actuating means are of pneumatic type

[c0022] 22.The pallet recited in Claim 16, wherein at least one of said support means has an elongated portion movable in a substantially axial direction suitable for engaging with the corresponding portion of said shaft of said armature, said elongated portion being capable of inserting in the space set between the coils and said shaft of the armature

[c0023] 23.The pallet recited in Claim 22, wherein said elongated portion of said support means is connected to said actuating means with a releasable connection so that it can be replaced by one of different size

[c0024] 24.The pallet recited in Claim 16, wherein a moving away stroke of said first and said second support means is biased by resilient means

[c0025] 25.The pallet recited in Claim 16, wherein said support means have an end shaped in order to provide substan-

tially a bevel that makes easier the location from the above of said armature on said pallet

[c0026] 26.The pallet recited in Claim 18, wherein said support means are two jaws having a substantially “V-shaped” surface suitable for receiving shafts of armatures of different size

[c0027] 27.The pallet recited in Claim 16, wherein said base is provided with at least one opening

[c0028] 28.A method for handling electric motor armatures on automatic production lines using a pallet, said armatures having an axis and comprising a plurality of portions having axial symmetry, in particular a shaft and an armature stack of ferromagnetic sheets driven on said shaft, comprising the steps of carrying said armatures on said pallet engaging at least one of said portions having axial symmetry; and, maintaining the armatures with axis substantially horizontal for preventing movement of said armatures during transportation.

[c0029] 29.The method for handling armatures recited in Claim 28, wherein said armatures are borne by said pallet at said armature stack and at the same time held at said armature stack preventing said armature from moving

with respect to said support means

[c0030] 30. The method for handling armatures recited in Claim 28, wherein said armatures are carried on said pallet holding them at said shaft by support means capable of approaching and/or moving away from each other with respect to the axis of said armature at the moment of receiving and/or releasing a portion thereof